



PJM Interconnection

Smart Grid Investment Grant Update

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NASPI Work Group Meeting
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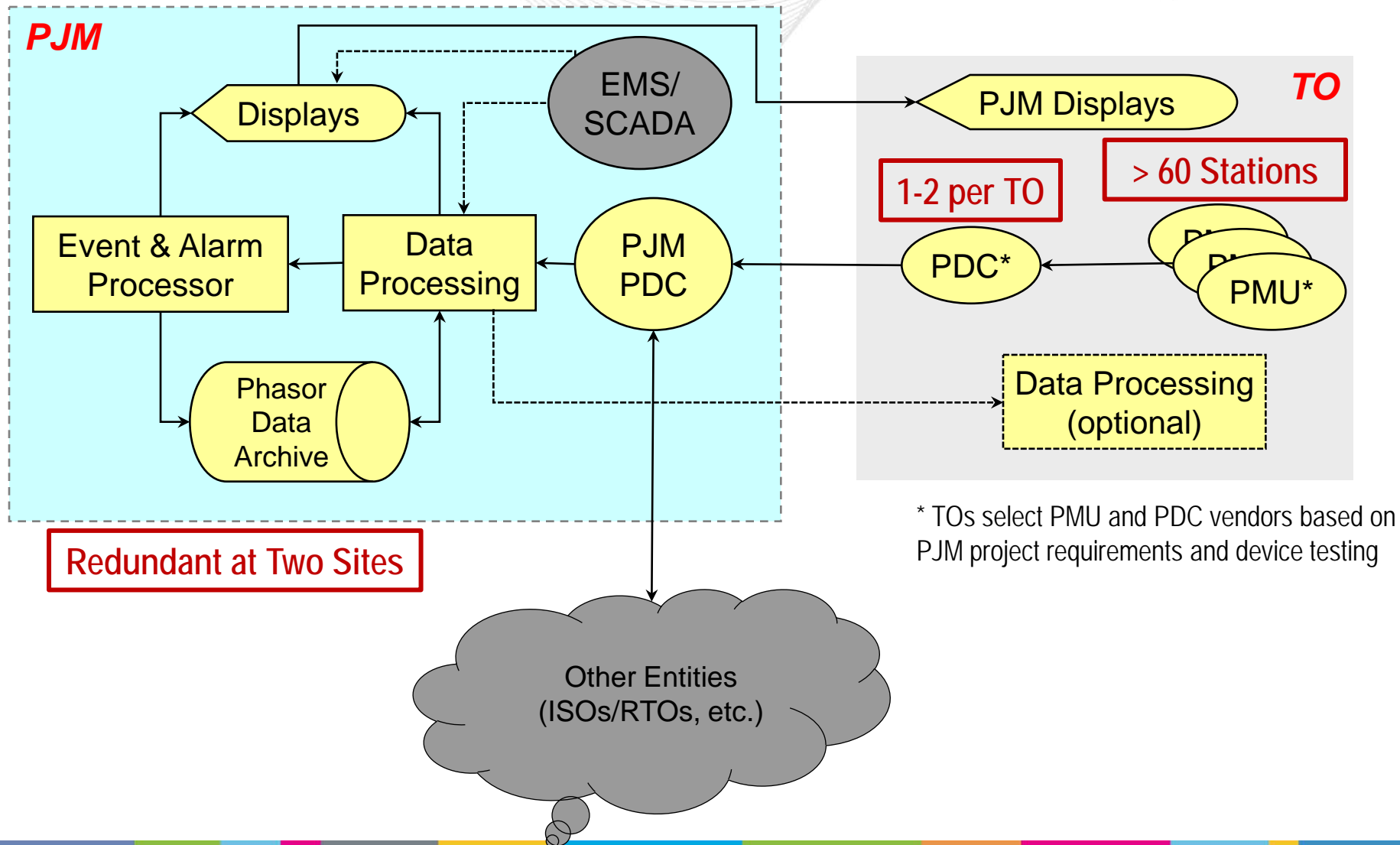
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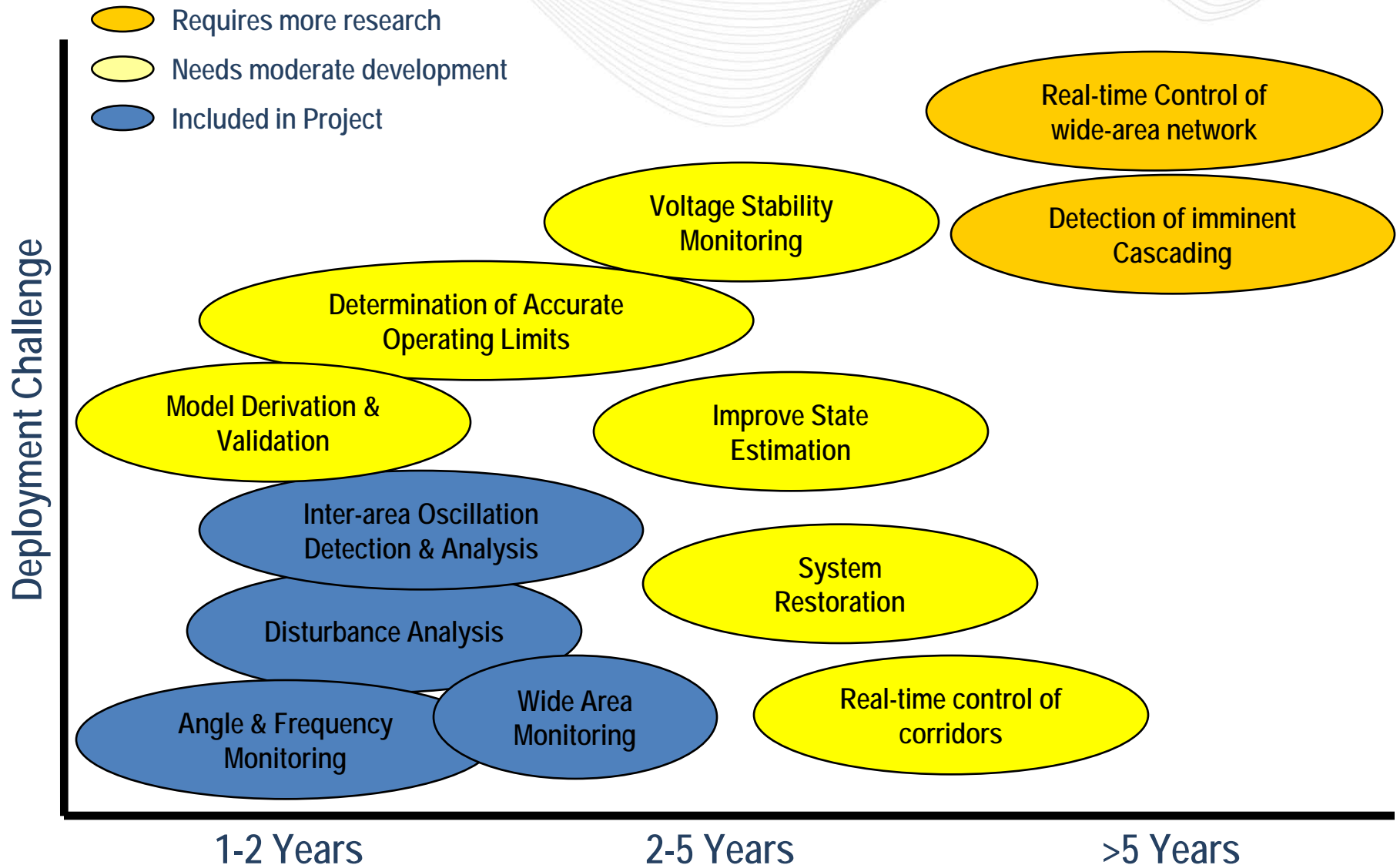
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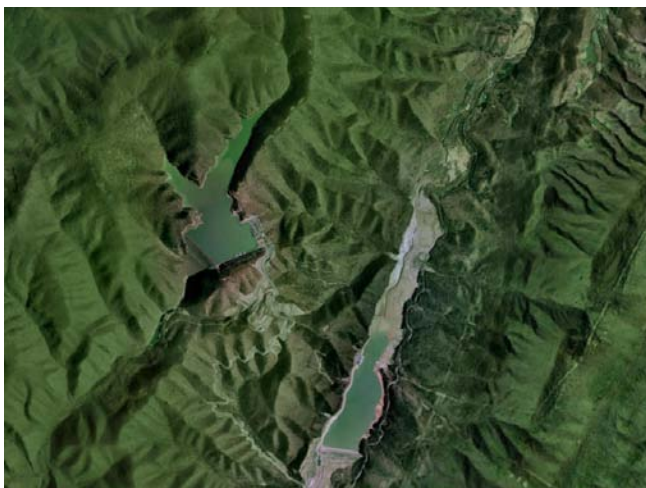
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- PJM Leads:
 - Project Manager: David Ulmer (ulmerd@pjm.com)
 - SynchroPhasor Technical Lead: Mahendra Patel (patelm3@pjm.com)
- Vendor Partners:
 - Electric Power Group (visualization software)
 - Quanta Technology (engineering/project management)
 - Virginia Tech University (PMU/PDC device testing)

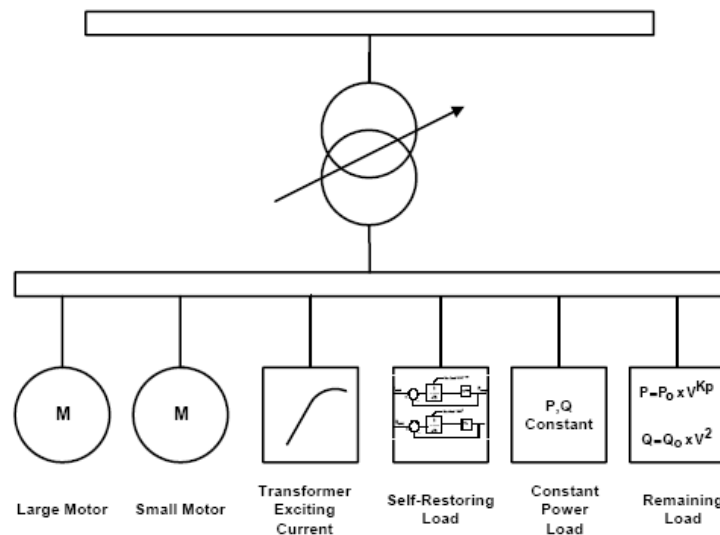
Transmission Owner	# of Substations with PMU Installations	# of Central PDCs
Allegheny Power	8	2
American Electric Power	1	1
Baltimore Gas & Electric	2	1
Commonwealth Edison	4	1
Duquesne Light	2	2
FirstEnergy Services	7	2
PECO Energy	3	1
PEPCO Holdings Inc.	4	2
PPL Electric Utilities	12	1
Public Service Electric & Gas	12	2
Rockland Electric	1	1
VA Electric & Power (Dominion)	11	1

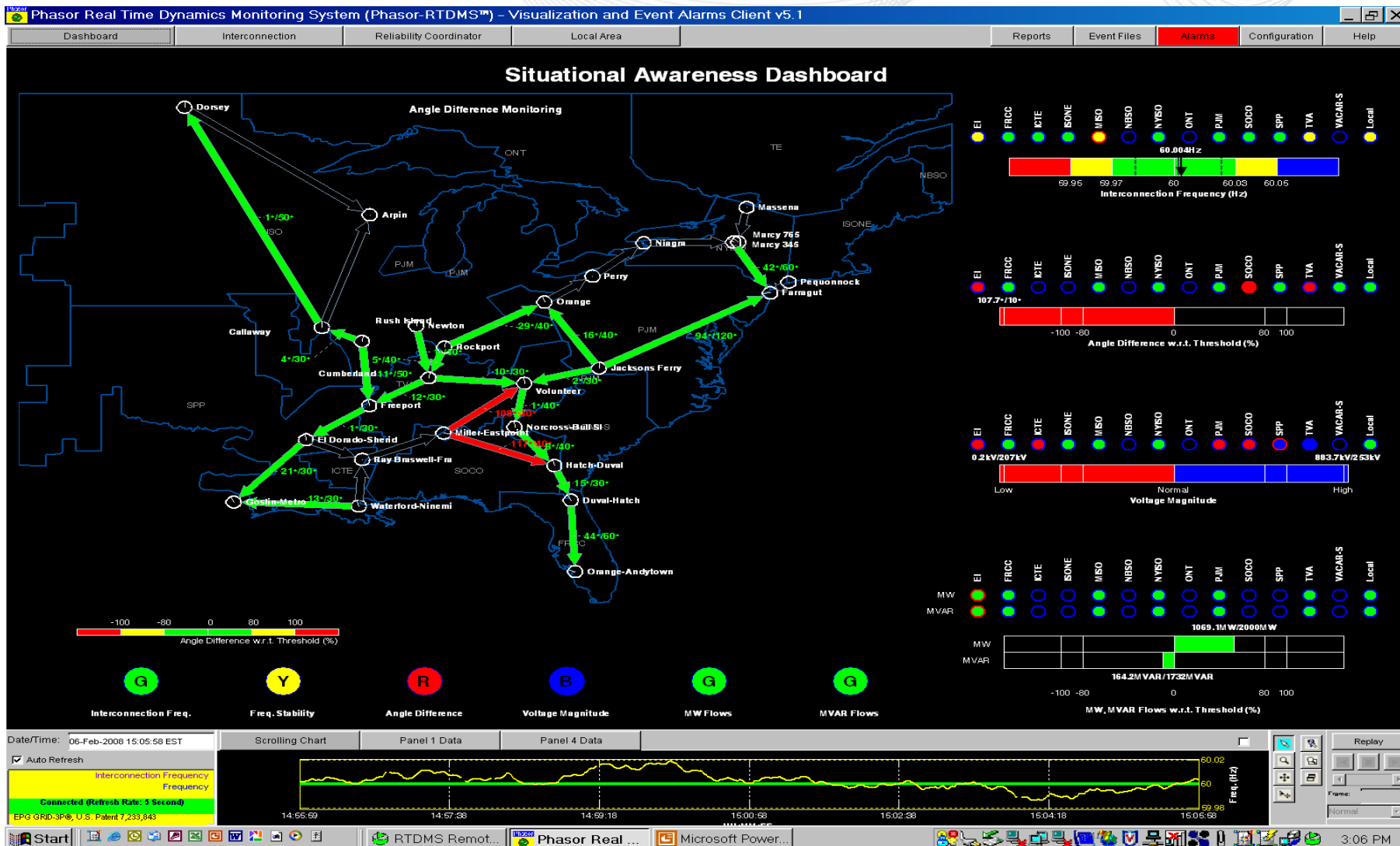






- Load models are the least accurate component of the power system model.
- Having synchrophasor data will help better characterize and represent loads in system studies





SynchroPhasor Security Framework

Cyber Security & Regulatory Compliance

Benefits

- Detection
- Response
- Mitigation
- Correction
- Restoration

Elements of Security

Requirements and Design

Logging and Monitoring

System Testing

Network Segmentation

Perimeter Protection

System and Communication Protection

User Security

Centralized Auditing and Monitoring

NERC CIP Standards (Elements of Compliance)

CIP-002

CIP-003

CIP-004

CIP-005

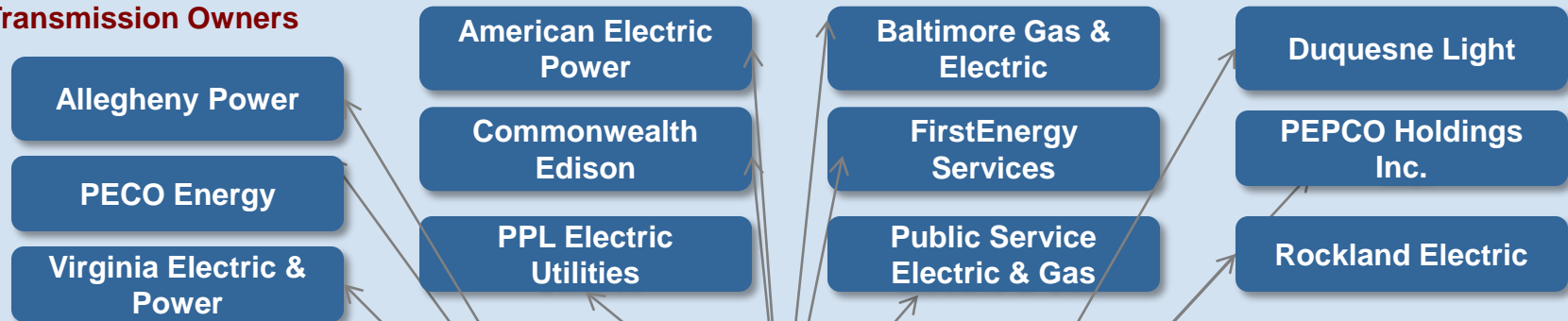
CIP-006

CIP-007

CIP-008

CIP-009

Transmission Owners



Security Partnership

PJM Security

Benefits

- Security influence
- Knowledge sharing
- Effective practices
- Networking

Vendor Questionnaire

Audit and Accountability

Questions	Yes - No - N/A	Comments
Is the log in syslog format? Or, is the log in Windows event viewer format?		
Can the logs be forwarded to a central log repository?		
What happens when the circular log overwrites itself?		
Is there a way to save log entries full?		
Can the logs hold at least 3 days?		
Who has access to security log?		
What type of (security) information being logged?		
What is the storage capacity or many days of data it will hold?		
What are the default security alerts?		
Can user defined alerts be configured?		
What type of notification does the software support?		
What time stamps does the log support?		

Standard CIP-002-3.4 — Cyber Security — Critical Cyber Asset Identification

A. Introduction

- Title:** Cyber Security — Critical Cyber Asset Identification
- Number:** CIP-002-3.4
- Purpose:** NERC Standards CIP-002-3.4 through CIP-009-3.4 provide a cyber security framework for the identification and protection of Critical Cyber Assets to support reliable operation of the Bulk Electric System.

These standards recognize the differing roles of each entity in the operation of the Bulk Electric System, the criticality and vulnerability of the assets needed to manage Bulk Electric System reliability, and the risks to which they are exposed.

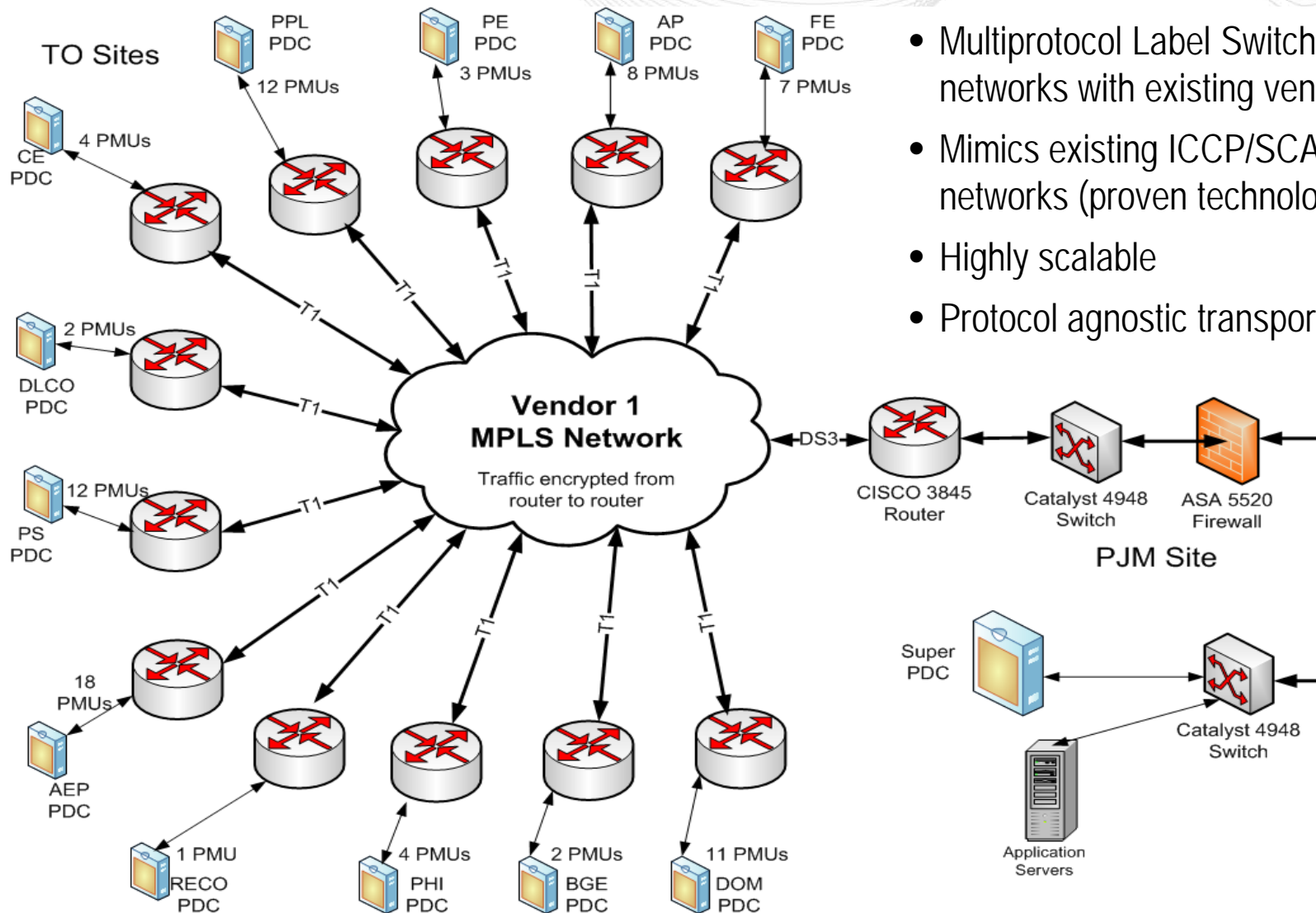
Business and operational demands for managing and maintaining a reliable Bulk Electric System increasingly rely on Cyber Assets supporting critical reliability functions and processes to communicate with each other, across functions and organizations, for services and data. This results in increased risks to these Cyber Assets.

Standard CIP-002-3.4 requires the identification and documentation of the Critical Cyber Assets associated with the Critical Assets that support the reliable operation of the Bulk Electric System. These Critical Assets are to be identified through the application of [the criteria in Attachment 1a-risk-based assessment](#).

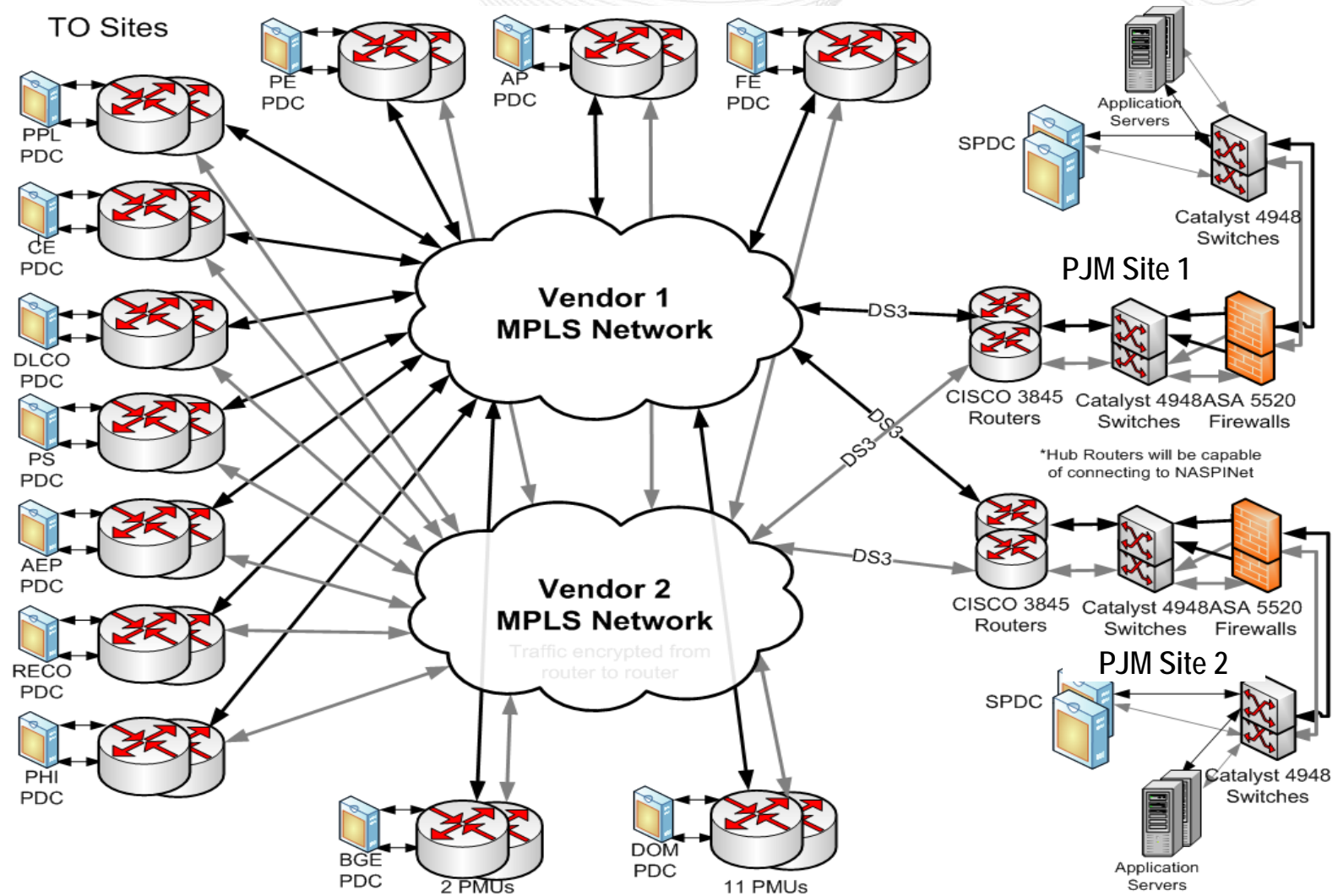
4. Applicability:

- Within the text of Standard CIP-002-3.4, "Responsible Entity" shall mean:
 - Reliability Coordinator.
 - Balancing Authority.
 - Interchange Authority.
 - Transmission Service Provider.

- Vendor review matrix, to facilitate the uniformity of the vendor evaluation process.
- Standard, minimum audit log requirements (IEEE 1686 standard) to ensure PJM and TOs receiving /monitoring the same data sets
- Discuss industry events and impact to project



- Multiprotocol Label Switching (MPLS) networks with existing vendors
- Mimics existing ICCP/SCADA networks (proven technologies)
- Highly scalable
- Protocol agnostic transport



- High-level Project Challenges
 - Evolving standards, technologies, and security guidelines
 - Coordination of all project stakeholders (TOs, Vendors, ISO/RTOs, DOE)
- Architecture, Design, and Communications Challenges
 - Project requirements/design lead standards development
 - Confidence in the performance of PMU/PDC equipment
 - Ensuring the architecture is scalable (more PMU's in the future)
 - Ensuring the architecture is extensible (supporting more applications in the future)
 - Complexities of sharing data between organizations

- Other Project Updates
 - PJM and MISO to begin real-time data sharing in Q2 2011
- Opportunities for NASPI
 - Continued forum to discuss optimal architectures, project requirements, performance of equipment, and lessons learned
 - Take a lead role in further expansion of NASPI net Use Cases and the development of an implementation of the NASPI net functions